Database Specifications
Standard Operating Procedure

Revision Log

Revision	Description of Change	Author	Effective Date
1	Original draft	G. Sanders	10/01/2005
1.1	Updated ref docs.	G. Sanders	09/14/2006

Purpose

To familiarize NPS staff and cooperators of the database standards used byt the NCRN I&M Program. The I&M Program developed a standard database template referred to as the Natural Resources Database Template (NRDT) to help standardize the overall design and functioning of databases used for I&M Program projects.

Scope and Applicability

The standards described in this document are relevant to all NCRN databases. While the specific fields included in the database may differ on a project by project basis, the general structure, organization of the database should be the same as the information presented here. Therefore, a separate data dictionary will be developed for each database to define all data elements; the data dictionary should be used in tandem with this document as a starting point and users guide to I&M Program databases.

Reference Documents

- Balter, Alison. 2002. Alison Balter's Mastering Access 2002 Desktop Development. Sams Publishing, Indianapolis, Indiana. 1348 pages.

- NRDT Version 3 Documentation

- NCRN SOP – Data Entry and Verification

Procedures and General Requirements

- All databases from the NCRN I&M Program are based upon the model of the Natural Resource Database Template (NRDT, version 3), available online at: http://science.nature.nps.gov/im/apps/template/index.htm. The NRDT is a relational database in MS Access that may be used as a stand-alone database or linked to ArcView GIS software using other tools from the I&M Program such as ArcView to Access (available online at: http://www.nps.gov/akso/gis/).

Database Structure

Project databases are composed of a front-end forms interface (project_db.mdb) that is linked to one or more back-end tables that contain common tables (Common_db.mdb) used by multiple projects as well as the database where the actual project data is stored (project_be_db) (Figure 2). This format is not required but structuring the database in this manner assists in data organization and management. Incorporating

**Database Specifications
Standard Operating Procedure**

tables that are common to many projects in one database eliminates the incorporate these common tables directly into each project database.
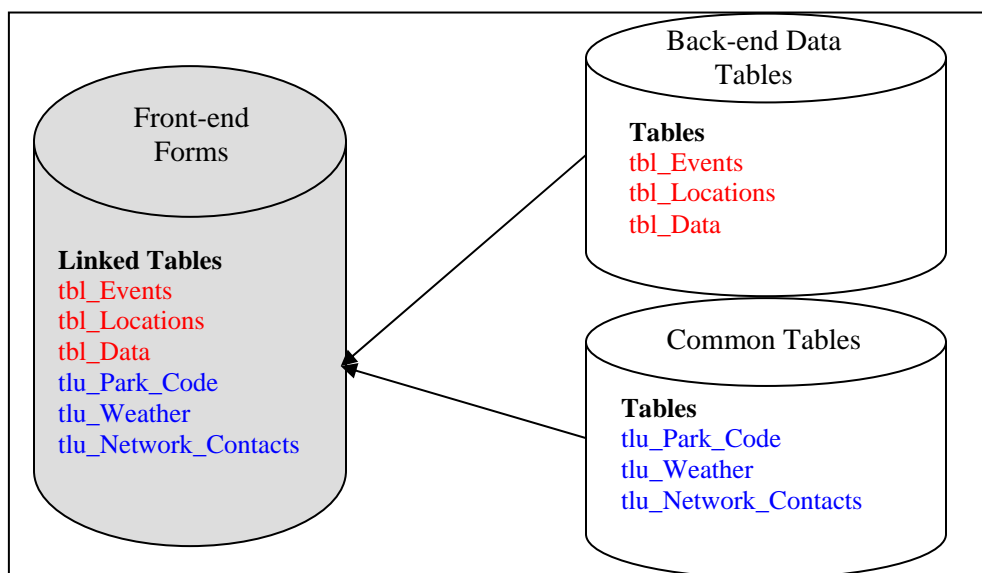

Figure 2. Diagram of NCRN project database structure.

Front-end

Forms database – This is the only part of the combined database structure that the users will work with. Data is entered into the forms and stored in the relevant tables in the back-end databases. The following are some common forms and sub-forms used during data entry.

- frm_Locations – Data entry form for locations information

    o sfrm_Sites – subform under the locations form where site information can be entered.

- frm_Events

    o sfrm_Event_Details – subform where additional event information such as weather information can be entered

    o sfrm_Meta_Events – used to enter information on when data was entered as well as who entered it and when QA/QC was performed and by whom.

- frm_Project_Data – field data

- frm_Contacts – form to enter new project or network contacts.

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Database Specifications
Standard Operating Procedure

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Two tables, tbl_Locations and tbl_Events, are the two core tables storing the sampling event and locations information for the project. These core tables are accompanied by project related tables that contain the project field data, voucher information and taxonomic look-up tables.

> **Note:** Database users should not try and alter or change the data entry forms or the back-end structure in any way. If problems are encountered during data entry, please contact the NCRN data manager for assistance.

Data Entry

Data entry is initiated through the database switchboard which will open upon once the database application has finished opening. From this screen the user can enter locations data or field data. Note, if field data is selected the user can still link to the locations for from the data forms if new locations need to be entered. From the project data entry form, the user can enter location information (where), event information (when and what were the field conditions) and field data (what was collected).

The forms are designed to make data entry efficient through the use of pick lists and auto-populated fields. The data entry forms are broken into three tabs.

- Event Details Tab: The first tab contains fields for entering details about the sampling event including weather conditions, observers and field notes. This tab also contains a subform used to track when data was entered, checked and verified.

- Data Tab : The purpose of the data tab is self explanatory. All data collected in the field is entered here. Species look-up tables are pre-populated based on the current species lists from NCRN parks and the taxonomy is based upon ITIS (Integrated Taxonomic Information System, from the USDA). Species can be added to the look-up table and this is aided with a direct through a hyperlink to the USDA ITIS website. All species records in the look-up table are accompanied by the ITIS taxonomic serial number (TSN). The user can also indicate whether specimens were collected and if those specimens were prepared as vouchers.

- Vouchers Tab: The final tab is where voucher information is entered. Certain fields are prepopulated such as the taxonomic information. Ideally a set catalog numbers will be obtained prior to starting the project and they can also be automatically assigned.

Data Verification

Once data entry is complete for a set a of field data, the newly entered data must undergo quality control and assurance measures to make sure the data was entered correctly. Users can document when they have completed these steps through the fields on the data entry form.

Data Maintenance and Reports

The Reports screen allows the user to: (1) Generate Current Species Lists, (2) Preview and Print Herbarium Labels, and (3) Generate ANCS+ and Upload Spreadsheet – which combines the fields necessary for ANCS+ records into a spreadsheet which may be uploaded into ANCS+.

Responsibilities

Database Specifications
Standard Operating Procedure

- <u>Project Scientist:</u> The project scientist will work with the data manager at the outset of the project to develop a database that supports both project (protocol) and programmatic needs. Please review the database specifications and the data dictionary that were developed specifically for your project, prior to starting field work, to ensure that the database will meet project needs and will capture all raw data. In addition, please use the database as provided or discuss necessary changes with the data manager. Changes to the database may result in problems with the database itself, or incompatibilities with other I&M Program data management needs. Finally, please work with data entry personnel (especially those not involved in data collection) to ensure they understand the database and your field data sheets before entering any data.

- <u>Data or Project Manager:</u> The data manager will work with the project scientist to develop a database that meets both project and I&M Program needs. Database development is typically a back-and-forth process that results in an implementation that works for everyone involved. Upon completion of the database, the data manager will develop a data dictionary that describes all data fields in the database, to ensure the greatest level of understanding by all database users and data entry personnel. Finally, the data manager will also work with data entry personnel to ensure that data are being entered properly and that quality assurance methods are being followed.

- <u>Data Entry Personnel:</u> Please review the data dictionary and the database specifications document before attempting to use the database you have been provided. Also, familiarize yourself with the project's field data sheet before beginning data entry. In general, the basic rule is: don't hesitate to ask any questions before beginning to enter data – you certainly don't want to go back and delete entries due to some misunderstanding.